Fig. 1

Fig. 2

FERMENTATION PROCESS OF ORIGINAL STRAIN
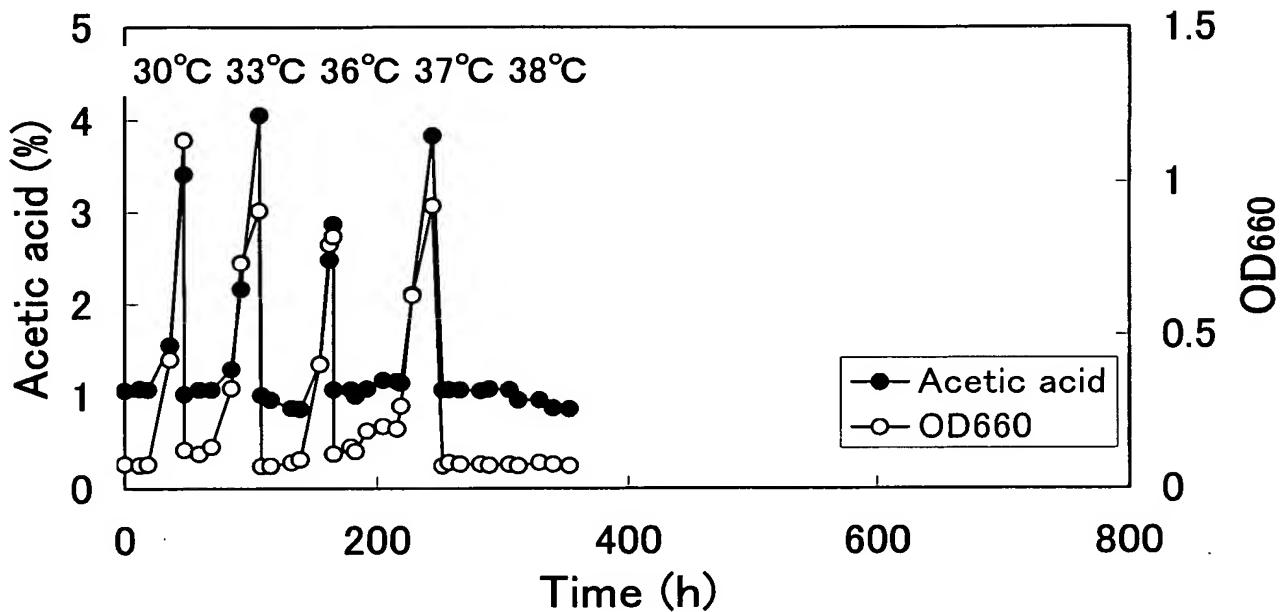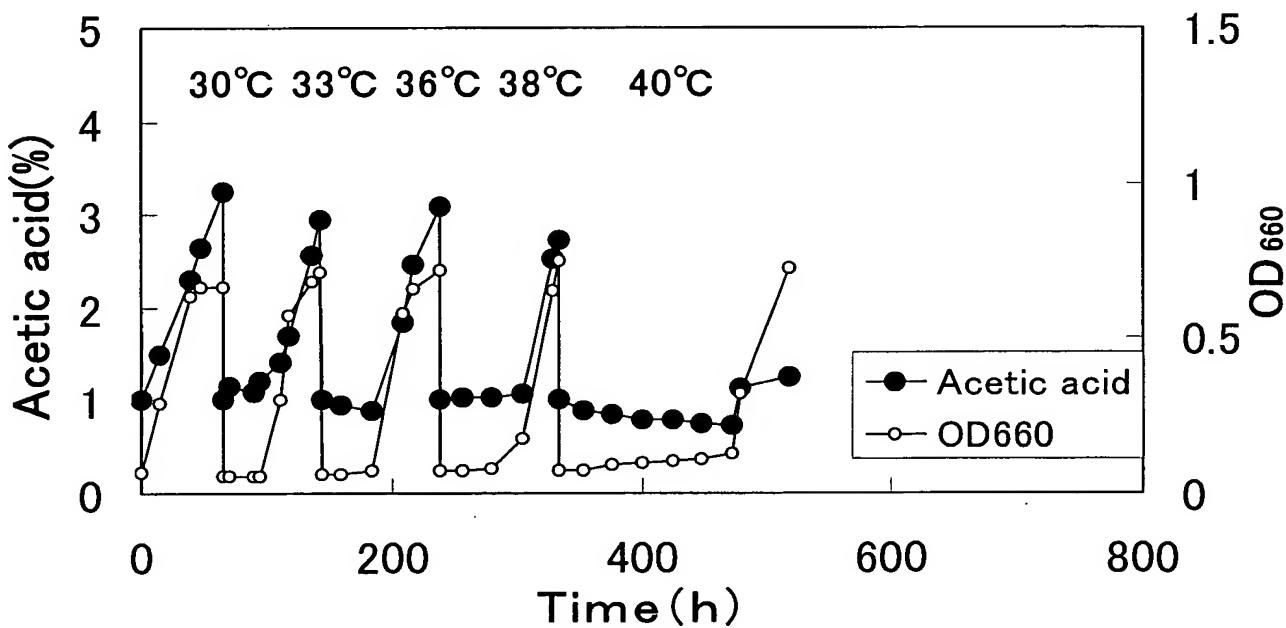
30°C 33°C 36°C 37°C 38°C

FERMENTATION PROCESS OF TRANSFORMANT

30°C 33°C 36°C 38°C 40°C

Fig. 3

FERMENTATION PROCESS OF ORIGINAL STRAIN

30°C 33°C 36°C 37°C 38°C

Acetic acid (%)

OD660

- Acetic acid
- OD660

Time (h)

FERMENTATION PROCESS OF TRANSFORMANT

30°C 33°C 36°C 38°C 40°C

Acetic acid(%)

OD660

- Acetic acid
- OD660

Time(h)
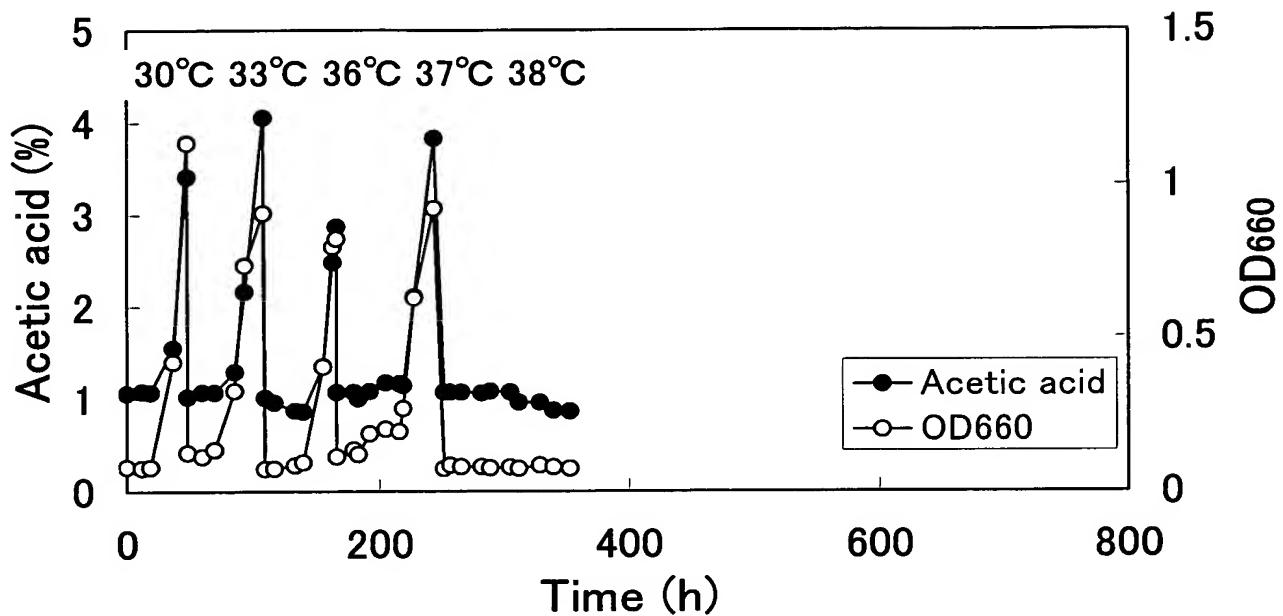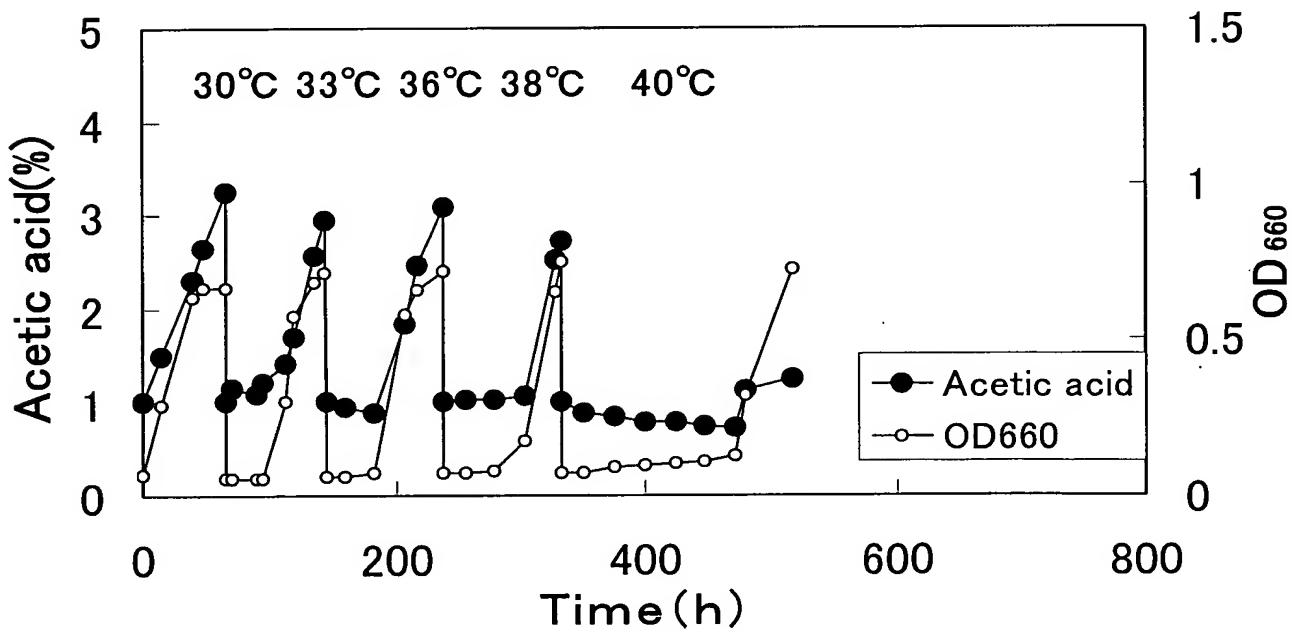
Fig. 4

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ArgMetAspArgAlaValProMetProPro ValSerValLeuLysProLeuHisGlyAsp  60
GluProLeuLeuGluGluAlaLeuGluSer PheCysThrGlnAspTyrProGlnMetGln  80
IleValPheGlyValGlnAlaGluAspAsp AlaAlaIleProIleValGlnArgLeuMet 100
GluArgHisProAspValGlnMetGluLeu ValIleAspProThrPheHisGlyLeuAsn 120
ArgLysIleGlyAsnLeuIleAsnIleMet ThrArgValLysHisAspValLeuValIle 140
SerAspSerAspIleHisValAlaProAsp TyrLeuArgHisValValGlyAlaMetVal 160
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ValGlyGluThrSerMetArgGluValLeu AlaHisGluLeuArgTrpGlyArgThrVal 280
LysThrLeuGluProAlaGlyTyrAlaAla SerAlaIleGlnLeuProLeuPheTrpAla 300
SerValAlaValLeuAlaAlaProHisAla ThrTrpThrTrpSerPhePheLeuGlyAla 320
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SerValThrGlyThrArgValAlaTrpArg GlyGlnThrMetHisValThrProHisSer 380
ValMetThrProArgSerGlnProAlaSer ProGlyAsp                       393
```

Fig. 5

5'-GAAGAGTGATATTACACTTCCCTGACGCCG-3'

Fig. 6

5'-CCCGTTCTTATTAACGACAGGGTTGG-3'

Fig. 7

```
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gccggaaaga taatgtctgt tttcaacgct cttgtttcac ccgccggact ggccgcgacc     120
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Fig. 8
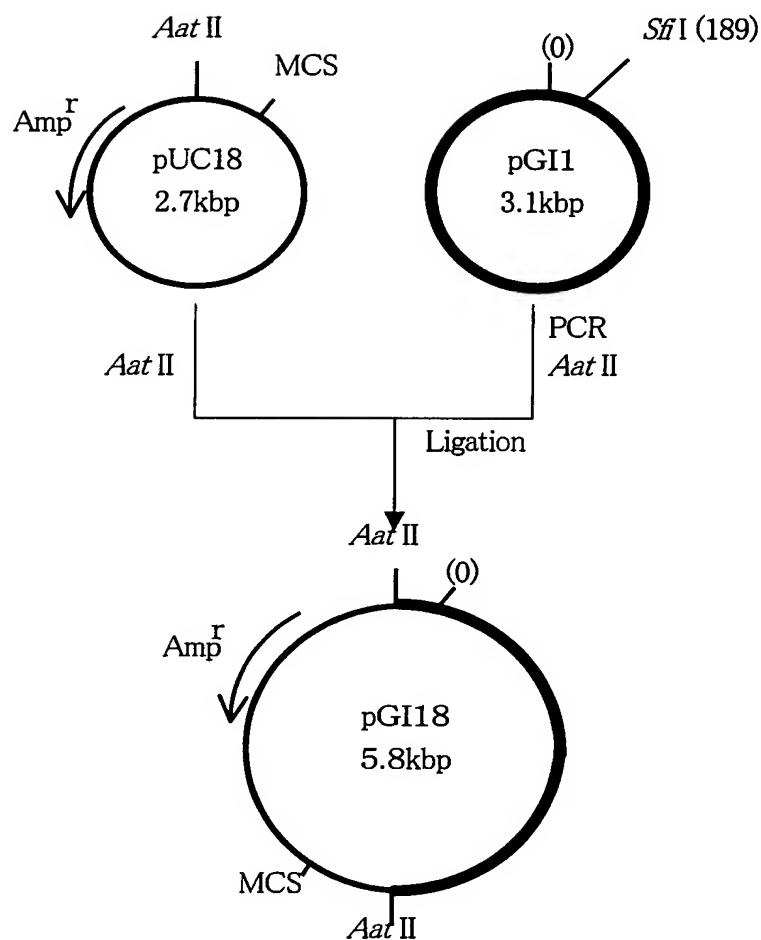
Fig. 9

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gcaccttctg ctacccccacc cagaacgcca gcggctgggc tgtgcagcca tgatcgccaa   180
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```

Fig. 10

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Fig. 11

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```

Fig. 12

cgctgacgtc gtgggccgtg ccagaggccc

Fig. 13

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